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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/568,114

02/13/2006

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8180 GREENSBORO DRIVE

SUITE 850

MCLEAN, VA 22102

EXAMINER

HAMILL, ERIC R

ART UNIT

PAPER NUMBER

2817

NOTIFICATION DATE

DELIVERY MODE

05/01/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/568,114	<b>Applicant(s)</b> FUJII ET AL.	
	<b>Examiner</b> ERIC R. HAMILL	<b>Art Unit</b> 2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) \_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-16 and 18-25 is/are rejected.
- 7) ☒ Claim(s) 17 and 26-28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>2-13-06, 4-4-07, and 8-23-07</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

2.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 18 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 18 and 23 recite the limitation "the first and second signal lines." There is insufficient antecedent basis for this limitation in the claim. Furthermore, it is unclear whether "the first and second signal lines" belong to the "at least two of the plurality of signal lines" which intersect, as defined in claim 12.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 12-16 and 18-24 are being rejected under 35 U.S.C. 102(e) as being anticipated by Shibahara (US Patent No. 2004/0196119).

Regarding claim 12, Shibahara, in **Fig. 22**, teaches a surface acoustic wave device (Fig. 22, SAW device 309; [0193]) comprising:

- a substrate [0199];
- a plurality of terminals (Fig. 22 pads 330, 351-352) disposed on the substrate and including at least an unbalanced terminal (Fig. 22, input terminal 330; [0194]) and two balanced terminals (Fig. 22, output terminals 351-352; [0196]);
- at least one surface acoustic wave (Fig. 22, SAW device 309) element disposed on the substrate between the unbalanced terminal and the balanced terminals (Fig. 22);
- a plurality of signal lines (Fig. 22, wiring traces 340, and 361-365) connected to the at least one surface acoustic wave element (Fig. 22);
- wherein at least two of the plurality of signal lines (Fig. 22, Traces 361-362 intersect with 365) connected to the at least one surface acoustic wave element (Fig. 22) intersect one another with an insulating film (Fig. 22, resin pattern 2a; [0197]) disposed therebetween.

Regarding claim 13, Shibahara, in **Fig. 22**, further teaches a surface acoustic wave device wherein the insulating film is polyimide [0197].

Regarding claim 14, Shibahara, in **Fig. 22**, further teaches a surface acoustic wave device wherein the at least one surface acoustic wave element (Fig 22, SAW device 309) includes at least two surface acoustic wave elements (Fig. 22 shows two SAWs 310 and 320);

one of the at least two surface acoustic wave elements defines a first element (Fig. 22 SAW 310) that is connected to the unbalanced terminal and to a ground pad (Fig. 22, SAW 310 is connected to unbalanced input terminal 330, and to ground pads 341-344; [0194-0195]);

another of the at least two surface acoustic wave elements defines a second element (Fig. 22, SAW 320);

at least two of the plurality of signal lines (Fig. 22, traces 361-362) define signal wirings arranged to connect the second element to the first element (Fig. 22);

one of the plurality of signal lines defines a ground wiring (Fig. 22, traces 340 and 365 comprise one ground trace) arranged to connect the first element (Fig. 22, SAW 310) to the ground pad (Fig. 22, ground pad 341 or 342);

at least one of the signal wirings (Fig. 22, traces 361-362) and the ground wiring (Fig. 22, trace 365) intersect (Fig. 22) with the insulating film disposed therebetween (Fig. 22, resin pattern 2a, [0197]); and the ground pad (Fig. 22, pads 341 or 342) is disposed outside of an area enclosed by the first element, the second element and the signal wirings (Fig. 22).

Regarding claim 15, Shibahara, in **Fig. 22**, further teaches a surface acoustic wave device wherein the first element (Fig. 22, SAW 310) includes three IDTs (Fig. 22, IDTs 311-313) disposed in a propagation direction of a surface acoustic wave (Fig. 22), and the unbalanced terminal (Fig. 22, terminal 330) and the ground pad (Fig. 22, pad 341 or 342) are connected (Fig. 22) to a middle IDT (Fig. 22, lower electrode of IDT 311) of the three IDTs;

the second element (Fig. 22, SAW 320) includes three IDTs (Fig. 22 IDTs 321-323) arranged in the propagation direction of the surface acoustic wave (Fig. 22), and the two balanced terminals (Fig. 22, terminals 351 and 352) are connected (Fig. 22) to a middle IDT (Fig. 22, IDT 321) of the three IDTs; and the IDTs on either side (Fig. 22, IDTs 312 and 313) of the middle IDT of the first element and the IDTs on either side (Fig. 22, IDTs 322 and 323) of the middle IDT of the second element are connected by the signal wirings (Fig. 22, wirings 361 and 362).

Regarding claim 18, Shibahara in **Fig. 22** further teaches a surface acoustic wave device wherein the at least one surface acoustic wave element includes at least two surface acoustic wave elements (Fig. 22, SAWs 310 and 320) connected to each other (Fig. 22);

one of the at least two surface acoustic wave elements defines a first surface acoustic wave element (Fig. 22, SAW 320) which is a longitudinally coupled resonator-type [0193] surface acoustic wave element having three IDTs (Fig. 22, IDTs 321-323) disposed along a propagation direction of a surface acoustic wave (Fig. 22), and the

**middle IDT** (Fig. 22 IDT 321) of the three IDTs **is connected to the two balanced signal terminals** (Fig. 22, terminals 351-352; [0196]) through ~~the~~ **a first and second signal line** (Fig. 22, traces 363-364) of the plurality of signal lines; the two balanced signal terminals are disposed on either side of a central axis of the substrate substantially in parallel to the direction in which the two surface acoustic wave elements are arranged (Fig. 22); and at least one of the first and second signal lines (Fig. 22, traces 363-364) is disposed on the insulating film (Fig. 22, film 2b; [0199]).

Regarding claim 19, Shibahara in further teaches in **Fig. 22** a surface acoustic wave device wherein the two balanced signal terminals are disposed so as to be substantially symmetrical about the central axis of the substrate (Fig. 22).

Regarding claim 20, Shibahara further teaches in **Fig. 22** a surface acoustic wave wherein the second surface acoustic wave element (Fig. 22, SAW 310) is disposed in the propagation direction of a surface acoustic wave (Fig. 22) and is a longitudinally coupled resonator-type [0193] surface acoustic wave filter element having three IDTs (Fig. 22, IDTs 311-313) cascade-connected [0193] to the first surface acoustic wave element (Fig. 22 SAW 320).

Regarding claim 21, Shibahara further teaches in **Fig. 22** a surface acoustic wave device wherein the second surface acoustic wave element (Fig. 22, SAW 310)

includes one surface acoustic wave resonator element (Fig. 22, SAW 310 has IDTs 311-313 and reflectors 314-315).

Regarding claim 22, Shibahara further teaches in **Fig. 22** a surface acoustic wave device wherein the second surface acoustic wave element (Fig. 22, SAW 310) includes a plurality of surface acoustic wave resonator elements connected together (The lower electrodes of IDTs 311-313 are physically connected together through: resin pattern 2a and traces 361-362 and 365; though electrically insulated from each other).

Regarding claim 23, Shibahara further teaches in **Fig. 22** a surface acoustic wave device wherein the at least one surface acoustic wave element (Fig. 22, SAWs 310 and 320) is a longitudinally coupled resonator-type [0193] surface acoustic wave filter element including three IDTs (Fig. 22, IDTs 321-323) disposed along a propagation direction of a surface acoustic wave, and a middle IDT (Fig. 22, IDT 321) of the three IDTs is connected to the two balanced terminals (Fig. 22, terminals 351-352) through the first and second signal lines (Fig. 22, traces 363-364) of the plurality of signal lines; the balanced signal terminals (Fig. 22, terminals 351-352) are disposed on both sides of a central axis of the substrate substantially perpendicular to the propagation direction of a surface acoustic wave (See Fig. 22); and at least one of ~~the~~ a first and second signal line (Fig. 22, traces 363-364) is disposed on the insulating film (Fig. 22, resin pattern 2b).



Regarding claim 12, in the alternative, Shibahara also teaches in **Fig. 17a** a surface acoustic wave device (Fig. 17a, [0169]) comprising:  
a substrate (Fig. 17a, substrate 100; [0173]) a plurality of terminals (Fig. 17a pads 115, 117-119) disposed on the substrate and including at least an unbalanced (tab 115 is unbalanced because parts with the same reference numerals as Fig. 16A and 16B have the same function [0169], and IDTs 126 and 121 are “reversed” [0155]; thus creating a balun with input 115) terminal (Fig. 17a, input terminal 115) and two balanced (see description of balun above, which makes output terminals 117 and 119 balanced) terminals (Fig. 17a, output terminals 117 and 119); at least one surface acoustic wave (Fig. 17a shows four SAWs 102-105) element disposed on the substrate between the unbalanced terminal and the balanced terminals (Fig. 17a); and a plurality of signal lines (Fig. 17a wiring traces 106-109, and 151) connected to the at least one surface acoustic wave element (Fig. 17a); wherein at least two of the plurality of signal lines (Fig. 17a, Traces 107 and 108 intersect with ground trace 151; [0171]) connected to the at least one surface acoustic wave element (Fig. 17a) intersect one another with an insulating film (Fig. 17a, resin pattern 2; [0172]) disposed therebetween.

Regarding claim 13, in the alternative, Shibahara further teaches in **Fig. 17a** a surface acoustic wave device wherein the insulating film is polyimide (a polyimide resin is usually used [0231], and Fig. 17a functions the same as 16A and 16b [0169]; thus see also [0150] stating that the resin is polyimide).

Regarding claim 14, in the alternative, Shibahara further teaches in **Fig. 17a** a surface acoustic wave device wherein the at least one surface acoustic wave element includes at least two surface acoustic wave elements (Fig. 17a shows four SAWs 102-105);

one of the at least two surface acoustic wave elements defines a first element (Fig. 17a SAW 102) that is connected to the unbalanced terminal and to a ground pad (Fig. 17a, SAW 102 is connected to unbalanced input terminal 115, and to the ground pad 118, [0156]; note that Fig. 16A is the same as Fig. 17A except for a few differences [0170]);

another of the at least two surface acoustic wave elements defines a second element (Fig. 17a, SAW 103);

at least two of the plurality of signal lines (Fig. 17a, traces 106 and 107) define signal wirings arranged to connect the second element to the first element (Fig. 17a);

one of the plurality of signal lines defines a ground wiring (Fig. 17a, trace 151) arranged to connect the first element (Fig. 17a, SAW 102) to the ground pad (Fig. 17a, ground pad 118, [0156]);

at least one of the signal wirings (Fig. 17a, wiring 107) and the ground wiring (Fig. 17a, ground wiring 151) intersect (Fig. 17a) with the insulating film disposed therebetween (Fig. 17a, resin pattern 2); and the ground pad (Fig. 20, pads 404-405, [0126]) is disposed outside of an area enclosed by the first element, the second element and the signal wirings (Fig. 20 shows external ground terminals for the package of Fig.

17a; See [0126] describing Fig. 20 as being the packaging for the third embodiment; the third embodiment includes Fig. s 12-19 and Fig. 22 [0109]).

Regarding claim 16, Shibahara further teaches in **Fig. 17a**, a surface acoustic wave device wherein two sets of the first element (Fig. 17a, SAWs 102 and 104), the signal wirings (Fig. 17a, traces 106-109, and 151), and the second element (Fig. 17a, SAWs 103 and 105) are provided on the substrate (Fig. 17a, substrate 100); the first element of each set includes three IDTs (Fig. 17a, IDTs 120-122 and 125-127) disposed in a propagation direction of a surface acoustic wave (Fig. 17a), and the unbalanced terminal (Fig. 17a, pad 115) and the ground pad (Fig. 17a, pad 118) are connected to a middle IDT (Fig. 17a, the lower electrodes of middle IDTs 121 and 126 are connected to ground pad 118 by ground trace 151) of the three IDTs;

the second element of each set (Fig. 17a, SAWs 103 and 105) includes one IDT (Fig. 17a, IDTs 131 and 136) connected (Fig. 17a) to one of the balanced terminals (Fig. 17a, terminals 117 and 119) that is different from that in the other set (The middle IDTs are different because they are coupled to different SAW elements which produce balanced, or reversed, signals [0155]);

in each set, the two signal wirings (Fig. 17a, traces 106-109) connect the IDTs (Fig. 17a, IDTs 120, 122, 125, and 127) on either side of the middle IDT (Fig. 17a, IDTs 121, 131, 126, and 136) of the first element and the IDT of the second element; and the first elements of the two sets are opposite in phase (Fig. 16A and 16B have the same function as 17a, see [0169]; And IDTs 126 and 121 are “reversed” [0155]; thus creating

a balun with SAWs 104 and 105 having opposite phase than SAWs 102-103) with respect to each other.

Regarding claim 24, Shibahara in **Fig. 17a** further a surface acoustic wave device wherein the substrate (Fig. 17a, Piezo substrate 100) is a LiTaO<sub>3</sub> single crystal piezoelectric substrate [0088].

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 25 is being rejected under 35 U.S.C. 103(a) as being unpatentable over Shibahara (US Patent No. 5,657,199) in view of Taguchi (US Patent No 5,592,135).

Regarding claims 25, Shibahara teaches all of the limitations of claim 12 for the reasons above.

Regarding claims 25, Shibahara fails to teach a surface acoustic wave device wherein the substrate is a 40.+-5.degree Y-cut X-propagation substrate.

Taguchi teaches a surface acoustic wave device (Col. 10, line 37) wherein the substrate is a 40.+-5.degree Y-cut X-propagation substrate (Col. 10, line 40-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have made Shibahara's SAW filter with a 40.+-.5.degree. Y-cut X-propagation piezoelectric substrate, as taught by Taguchi, since Taguchi suggests that this substrate provides the benefit of a filter with such high reflectivity per electrode branch that sometimes the reflectors may be omitted (Col. 10, Line 44).

#### **Allowable Subject Matter**

9. Claims 17 and 26-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 17, Shibahara fails to teach a surface acoustic wave device wherein the ground wiring includes a **first layer** which is not disposed in the vicinity of the insulating film and a **second layer** which is disposed in the vicinity of the insulating film. In other words, Shibahara fails to teach a SAW device wherein the ground wiring is layered **above** the signal lines; Thus, Shibahara only has one layer of ground wiring.

**Conclusion**

10. Any response to this Office Action should be **faxed** to (571) 273-8300 or **mailed** to:

Commissioner for Patents,  
P.O. Box 1450  
Alexandria, VA 22313-1450

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Customer Service Window  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Hamill, whose telephone number is (571) 270-1802. The examiner can normally be reached Mon-Fri from 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal, can be reached at (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published

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application may be obtained from either Private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have question on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eric Hamill

Patent Examiner Art Unit 2817

**/BENNY LEE/  
PRIMARY EXAMINER  
ART UNIT 2817**